

REMARKS

Applicants thank the Examiner for total consideration given the present application. Claims 1-6 were pending prior to the Office Action. Claims 7-10 have been added through this Reply. Therefore, claims 1-10 are pending of which claims 1-3 are independent. Claims 3-6 are withdrawn as being directed to non-elected invention. Claims 1 and 2 have been amended through this Reply. Applicants respectfully request reconsideration of the rejected claims in light of the amendment and remarks presented herein, and earnestly seek timely allowance of all pending claims.

35 U.S.C. § 112, SECOND PARAGRAPH REJECTION

Claim 2 stands rejected under 35 U.S.C. § 112, second paragraph, as allegedly being indefinite.

Initially, Applicants disagree with the Examiner's assertion that the term "wherein the spatial modulator intensity-modulates the . . . instead of phase-modulating the . . ." renders the claims indefinite. Applicants respectfully submit that the Examiner's focus during examination for compliance with the requirement of definiteness in § 112, second paragraph is whether the claim meets the threshold requirements of clarity and precision. To do this, the Examiner needs only ensure that the claims define the invention with a reasonable degree of particularity and distinctness. See MPEP § 2173.02.

Applicants submit that claim 2 clearly defines the invention with a reasonable degree of particularity and distinctness since an alternative functionality, i.e., intensity modulation, of the spatial optical modulator has been claimed.

Although Applicants do not necessarily agree with the Examiner's assertion of indefiniteness, Applicants have amended claim 2 into an independent form in order to expedite prosecution.

Accordingly, Applicants respectfully request that the Section 112, second paragraph rejection of claim 2 be withdrawn.

35 U.S.C. § 103 REJECTION – Kobayashi, Riza, Izadpanah, Hong

A. Claim 1 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Kobayashi et al. (Japanese Patent Application Publication No. JP406276017)[hereinafter "Kobayashi"] in view of Riza (U.S. Patent No. 5,187,487)[hereinafter "Riza"]. Applicants respectfully traverse.

Applicants respectfully submit that the Examiner has failed to establish a *prima facie* case of obviousness. To establish a *prima facie* case of obviousness, the prior art reference (or references when combined) must teach or suggest all the claim limitations. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). Additionally, there must be a reason why one of ordinary skill in the art would modify the reference or combine reference teachings to obtain the invention. A patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art. *KSR Int'l Co. v. Teleflex Inc.*, 82 USPQ2d 1385 (U.S. 2007). There must be a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does. *Id.* The Supreme Court of the United States has recently held that the "teaching, suggestion, motivation test" is a valid test for obviousness, albeit one which cannot be too rigidly applied. *Id.* Rejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness. *Id.*

In this instance, it is respectfully submitted that neither Kobayashi nor Riza, alone or in combination teaches or suggests all claim limitations.

For example, claim 1 recites, *inter alia*, "***an optical multiplexer for converting the first and second signal light beams different in wavelength outputted from the spatial optical modulator into a multiplex signal light beam to travel a single coaxial optical path.***" (*Emphasis added.*)

It is respectfully submitted that neither Kobayashi nor Riza teaches the above-identified claim feature.

Kobayashi is directed to a conventional antenna feeder circuit that is concerned with multi-beam formation in which directions of a plurality of beams are determined based on positions of masks, respectively. Kobayashi's antenna feeder circuit includes two or more laser light sources, an optical distributor, a spatial light modulation device, a laser beam modulator, and an optical multiplexer 13.

The Examiner relies on the optical multiplexer 13 of Kobayashi as disclosing the above-identified claim feature. It is respectfully submitted that the optical multiplexer 13 of Kobayashi does not *convert a first and second signal light beams different in wavelength outputted from a spatial optical modulator into a multiplex signal light beam to travel a single coaxial optical path.*

Contrary to the claimed invention, multiplexer 13 of Kobayashi multiplexes an optical signal generated with each modulator, and outputs to each radiating element correspondence of the array antenna. Then, a light/electric transducer changes the optical signal corresponding to each radiating element into an electrical signal, respectively, and extracts a high frequency signal corresponding to each antenna beam, and supplies to each radiating element. (See paragraph [0018].) Indeed, Kobayashi clearly discloses that multiplexing is carried out and it is led to two or more optical transmission lines. (See paragraphs [0031] and [0033].)

As described in the specification, in conventional optical control type microwave phase controller, no more than one microwave phase wave surface can be formed by one spatial optical modulator, and therefore, the conventional phase controller cannot generate a feed signals for an array antenna for radiating a plurality of microwave beams. Further, although Kobayashi discloses an antenna feeder circuit that is concerned with multi-beam formation, directions of a plurality of beams are determined based on positions of masks, respectively. As a result, Kobayashi's antenna feeder cannot direct a plurality of beams in a same direction or cannot superimpose. Therefore, in Kobayashi's antenna feeder circuit, directions of a plurality of beams are limited among the mutual beams. Accordingly, the optical multiplexer 13 of Kobayashi cannot convert a first and second signal light beams different in wavelength outputted from a

spatial optical modulator into a multiplex signal light beam to travel a single coaxial optical path.

The claimed invention solves that above-noted problems associated with conventional optical control type microwave phase controller by providing an improved optical type microwave phase forming device which is capable of simultaneously forming a plurality of microwave phase surfaces using one spatial optical modulator. More specifically, the claimed invention can convert two lights into a multiplex output light beam to travel through a single optical path. (*Emphasis added.*)

Riza has not been, and indeed cannot be, relied upon to fulfill the above-noted deficiency of Kobayashi.

Therefore, at least the above reasons, it is respectfully requested to withdraw the rejection of claim 1 based on Kobayashi and Riza.

B. Claim 2 is rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Kobayashi and Riza, and further in view of Izadpanah et al. (U.S. Patent No. 7,020,396 B2)[hereinafter “Izadpanah”] and Hong et al. (U.S. Patent No. 4,965,603)[hereinafter “Hong”]. This rejection is respectfully traversed.

Amended claim 2 also recites, *inter alia*, “*an optical multiplexer for converting the first and second signal light beams different in wavelength outputted from the spatial optical modulator into a multiplex signal light beam to travel a single coaxial optical path.*” (*Emphasis added.*) As demonstrated above in great detail, neither Kobayashi nor Riza teaches the above-identified claim feature. Izadpanah and Hong have not been, and indeed cannot be, relied upon to fulfill the above-noted deficiency of Kobayashi and Riza.

Accordingly, it is respectfully requested to withdraw the rejection of claim 2 based on Kobayashi, Riza, Izadpanah, and Hong.

CONCLUSION


In view of the above amendment, Applicants believe the pending application is in condition for allowance.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Ali M. Imam Reg. No. 58,755 at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37.C.F.R. §§1.16 or 1.17; particularly, extension of time fees.

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Respectfully submitted,

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